BTEC Assignment Brief

Qualification	Pearson BTEC International Level 3 Foundation Diploma in Applied Science Pearson BTEC International Level 3 Diploma in Applied Science Pearson BTEC International Level 3 Diploma in Biomedical Scienc Pearson BTEC International Level 3 Diploma in Environmental Science Pearson BTEC International Level 3 Extended Diploma in Applied Science Pearson BTEC International Level 3 Extended Diploma in Biomedical Science Pearson BTEC International Level 3 Extended Diploma in Environmental Science
Unit number and title	**Unit 7: Principles and Applications of Physics II**
Learning aim(s)	**B:** Investigate the properties and uses of radioactivity
Assignment title	**Dangerous but useful - ionising radiation**
Assessor	
Issue date	
Hand in deadline	

Vocational Scenario or Context	You have been appointed as a supporting technician in the science department of a large school that delivers a wide range of subjects to sixth form learners. The centre is well resourced and has recently taken stock of a set of radioactive elements. The head of the science department has asked that you assist in the delivery of a physics lesson to Level 3 learners, to help provide additional knowledge and practical expertise to enable factual information to be given at each stage of the lesson. Many learners may be inspired by your help and guidance and may consider studying related science subjects at college or pursue job opportunities in related areas. To provide the best possible support to the Tutor and Learners, you will need to prepare notes and examples.

Task	Produce a detailed report on the main aspects of the periodic table with particular focus on atomic structure and related forces. This work should include: ● A **description** of particles in the atom and reference to Geiger and Marsden's experiments. ● An **explanation** of radioactive isotopes using atomic number & mass ● An explanation of the relative properties of alpha, beta and gamma radiation, including the effect of magnetic fields on the types of radiation. ● An **explanation** of nuclear forces and stability of the atoms, including the decay process Carry out and record a practical demonstration illustrating radioactive decay and half-life. You will need to **Explain** the differences of alpha, beta and gamma radiations and also the principles of nuclear *fission*.

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	Evaluate the method of detecting radiations, its effect on human and animal health and background radiation from human and natural sources. **Analyse** a detailed account as a *case study* of well-known nuclear accidents. This should focus on: o Specific times, dates and locations o Known causes of the accident o Deaths and injuries involved o Immediate and long term damage to the environment **Explain** how nuclear power stations generate electricity. You will need to include: ● A description of the uranium 235 atom and diagram of the nuclear fission process ● How the processes are contained ● A brief outline of the production of Plutonium **Evaluate** the benefits of radioactive sources in science and in medicine. This should include a brief outline of uses of radioactivity in: ● Gamma and X-ray radiography for medicine and industry ● Radioactive tracers for medicine and industry ● Radiocarbon and radioisotope dating in science
Checklist of evidence required	A report that includes: ● A description of particles in the atom ● An explanation of radioactive isotopes and nuclear forces ● An explanation of ionizing radiations and practical demonstration ● An evaluation of radiation effects on human/animal health ● An analysis in the form of a case study on nuclear accidents ● An explanation of the processes in nuclear power stations ● An evaluation of the benefits and main applications of radioactive sources in science, medicine and industry

Criteria covered by this task:	
Unit/Criteria reference	To achieve the criteria, you must show that you are able to:
B.D2	Evaluate the uses of radioactivity in terms of benefits and risks
B.M4	Explain the structure of atoms and forces involved
B.M5	Explain the essential aspects of ionising radiations
B.M6	Explain the main applications of ionising radiations
B.P4	Outline the structure of the atom, the periodic table and forces involved
B.P5	Describe the essential aspects of ionising radiations
B.P6	Describe the main applications of ionising radiations
Sources of information to support you with this Assignment	www.physics.org › article-questions hyperphysics.phy-astr.gsu.edu › hbase › Nuclear › radact ehss.energy.gov › ohre › roadmap › achre › intro_9_2

	whatisnuclear.com › radioactivity